

M.PHARM. DEGREE EXAMINATION**(Regulations 2010)****(For candidates admitted from 2010-2011 onwards)****FIRST YEAR****BRANCH II – PHARMACEUTICAL CHEMISTRY****PAPER II – ADVANCED ORGANIC CHEMISTRY***Q.P. Code : 262905***Time: Three Hours****Maximum: 100 marks****Answer ALL questions****I. Elaborate on :****(6 x 10 = 60)**

1. Explain localized and delocalized bonds with examples. Dipole moment applications.
2. Discuss briefly the different synthetic methodologies for obtaining drugs.
3. Discuss the structure stability and stereochemistry of free radicals.
4. Discuss in brief for attaching six member heterocyclic ring systems to drugs.
5. Define anchiomeric assistance by giving two examples define oxidation and reduction write about various oxidizing and reducing agents used in oxidation and reduction reaction.
6. Explain orientation and reactivity of Aromatic electrophlic substitution in mono and di-substituted benzene.

II. Write notes on :**(8 x 5 = 40)**

1. Explain the techniques used to prepare chiral drugs.
2. Explain hyper conjugation and Inductive effect.
3. Describe the mechanism of SN1 and SN2 reactions in the case of alkyl halides.
What is the order of reactivity of primary, secondary and tertiary halides in relation to SN1 and SN2 reaction? What factors determine this activity?
4. Discuss the free radical mechanism for the chlorination of methane.
5. Discuss Pinacol-Pinacolone rearrangement.
6. State orbital symmetry rules and their application.
7. Discuss protection and de protection of different groups.
8. Discuss nano chemistry in pharmaceutical field.

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY

Q.P. Code : 262905

Time: Three Hours

Maximum: 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

Pages Time Marks
(Max.) (Max.) (Max.)

- | | | | |
|---|----|---------|----|
| 1. a) Define reduction and write about various reducing agents used in reduction reactions. | 17 | 40 min. | 20 |
| b) Discuss the phase transfer catalysis and its applications in reduction reaction. | | | |
| c) Outline the mechanism and discuss the synthetic importance of Birch and Meerwin-Pondroff's reductions. | | | |
| 2. a) Discuss the stability and structure of free radicals. | 17 | 40 min. | 20 |
| b) Discuss the mechanisms of free radical addition and free radical substitution reactions with examples. | | | |

II. Write notes on :

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|---|---|---------|---|
| 1. Describe the synthetic approaches for attaching heterocyclic ring systems in drug molecules having five membered ring systems. | 4 | 10 min. | 6 |
| 2. Demonstrate the mechanisms of both acid and base-catalysis of tautomerisation. | 4 | 10 min. | 6 |
| 3. Discuss protection and de protection of different groups. | 4 | 10 min. | 6 |
| 4. Explain the mechanism and application of Reformatsky reaction. | 4 | 10 min. | 6 |
| 5. Explain the mechanism of aromatic electrophilic substitution reactions. | 4 | 10 min. | 6 |
| 6. Define chirality and discuss the importance of chiral drugs. | 4 | 10 min. | 6 |
| 7. Write the basic theory of photochemical reactions and mention their applications. | 4 | 10 min. | 6 |
| 8. Give an account on combinatorial chemistry. | 4 | 10 min. | 6 |
| 9. Explain in detail about retrosynthetic analysis. | 4 | 10 min. | 6 |
| 10. Explain with examples various types of pericyclic reactions. | 4 | 10 min. | 6 |

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Time: Three Hours

Maximum: 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

Pages Time Marks
(Max.) (Max.) (Max.)

- | | | | |
|--|----|---------|----|
| 1. a) What are reaction intermediates? Explain the reaction mechanisms involving any two of them. | 17 | 40 min. | 20 |
| b) Write a note on Retro synthetic analysis. | | | |
| 2. a) What is elimination reaction? Explain the mechanisms of E1 Reaction? | 17 | 40 min. | 20 |
| b) Enumerate the Stereo chemical aspects of SN1, SN2 reaction. | | | |

II. Write notes on:

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|--|---|---------|---|
| 1. Hoffman rearrangement reaction. | 4 | 10 min. | 6 |
| 2. Oppenauer oxidation. | 4 | 10 min. | 6 |
| 3. Application of photochemical reaction. | 4 | 10 min. | 6 |
| 4. Catalyst involved in reduction reaction. | 4 | 10 min. | 6 |
| 5. Disconnection approach. | 4 | 10 min. | 6 |
| 6. Chemistry of phenothiazine. | 4 | 10 min. | 6 |
| 7. Importance of chiral in the synthesis of medicinal compounds. | 4 | 10 min. | 6 |
| 8. Bifunctional components. | 4 | 10 min. | 6 |
| 9. Synthesis of indole. | 4 | 10 min. | 6 |
| 10. Electro cyclic reaction. | 4 | 10 min. | 6 |

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Time: Three Hours

Maximum: 100 marks

Answer ALL questions in the same order.

I. Elaborate on :

Pages Time Marks
(Max.) (Max.) (Max.)

- | | | | |
|---|----|---------|----|
| 1. a) Explain the mechanism and reactions of addition to carbon to hetero multiple bond. | 17 | 40 min. | 20 |
| b) Write a note on the localized and delocalized chemical bonding. | | | |
| 2. Define oxidation and reduction and discuss about various oxidizing and reducing agents used in the oxidation & reduction reaction. | 17 | 40 min. | 20 |

II. Write Notes on :

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|--|---|---------|---|
| 1. Discuss the inductive effect and electromeric effect. | 4 | 10 min. | 6 |
| 2. What is combinatorial chemistry. Explain it. How it is useful in drug discovery. | 4 | 10 min. | 6 |
| 3. Describe the homocyclic and heterocyclic bond fission. | 4 | 10 min. | 6 |
| 4. Explain the importance of chiral synthesis. | 4 | 10 min. | 6 |
| 5. Discuss the principles of micro beads in new solid phase synthesis. | 4 | 10 min. | 6 |
| 6. Describe the basicity of pyridine. | 4 | 10 min. | 6 |
| 7. Give any three reaction of furan and phenothiazine. | 4 | 10 min. | 6 |
| 8. Discuss the stability of free radicals. | 4 | 10 min. | 6 |
| 9. Describe the mechanism of Hoffmann's rearrangement reaction. | 4 | 10 min. | 6 |
| 10. Give the synthetic application of grignard reagent. | 4 | 10 min. | 6 |

[LC 344]

APRIL 2013

Sub. Code: 2905

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY

Q.P. Code : 262905

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on :

(2 x 20 = 40)

1. Define nucleophilic substitution reaction with examples.
Explain with examples the mechanism involved in SN1 reaction.
Enumerate some synthetic reaction involving the nucleophilic substitution reaction.
2. a) What is aromatic electrophilic substitution reaction?
Explain with examples the mechanism of them.
b) Write the mechanism and the application of reformatsky reaction.

II. Write notes on :

(10 x 6 = 60)

1. Asymmetric synthesis.
2. Theory of acids and basis.
3. Carbenes and nitrenes.
4. Deprotection of various groups.
5. Catalyst involved in hydrolysis.
6. Orbital symmetry rule.
7. Pericyclic reaction.
8. Free radicals.
9. Reaction of imidazole.
10. Localized and Delocalized chemical bond.

[LD 344]

OCTOBER 2013

Sub. Code: 2905

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY

Q.P. Code : 262905

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on :

(2 x 20 = 40)

1. a) Explain in detail the mechanism of Reformatsky reaction
- b) Describe the importance of Chiral drugs giving examples.

2. a) Classify heterocyclic compounds giving examples.

Write the preparations, properties of a fused ring structure containing a hetero atom.

- b) Describe the methods for the Deprotection of carboxyl groups.

II. Write notes on :

(10 x 6 = 60)

1. Carbenes.
2. Mechanism of Michal Reaction.
3. Nanochemistry.
4. Carbon to Nitrogen multiple bond.
5. Catalysts used in reduction reaction.
6. Protection of amino groups and carboxyl groups.
7. Free radical mechanism.
8. Delocalisation.
9. Theory of Acid and bases.
10. Retrosynthetic analysis.

[LE 344]

APRIL 2014

Sub. Code: 2905

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY

Q.P. Code : 262905

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on :

(2 x 20 = 40)

1. a) Explain in detail about the various types of pericyclic reactions and their mechanism.
b) What do you mean rearrangement reaction? Classify them.
Explain the different steps involved in it.
2. a) Discuss on combinatorial chemistry with special reference to its application in drug discovery.
b) Write a note on aliphatic nucleophilic substitution.

II. Write notes on :

(10 x 6 = 60)

1. Mechanism of Walden inversion.
2. Orbital symmetry rules and its applications.
3. Oppenauer oxidation.
4. Theory of Photochemical reactions.
5. Mechanism and applications of Ozonolysis.
6. 'Cotton effect' and 'Octant rule'.
7. Synthesis of Phenothiazine and Purine.
8. Steps involved in Free radical reactions
9. Chemical bonding.
10. Techniques for preparing chiral drugs.

[LF 344]

OCTOBER 2014

Sub. Code: 2905

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY

Q.P. Code : 262905

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on :

(2 x 20 = 40)

1. Write in detailed account of the Stereochemistry of five membered, six membered and fused ring systems.
2. a) Distinguish the features of E1 and E2 elimination reactions.
b) Explain the techniques for the preparation of chiral drugs.

II. Write notes on :

(10 x 6 = 60)

1. Neighboring group effect with suitable examples.
2. Hoffman rearrangement.
3. Importance of Stereo selective synthesis.
4. Nucleophilic substitution reactions of pyridine.
5. Importance of Michael reaction.
6. Different types of pericyclic reactions with examples.
7. Ozonolysis and its synthetic importance.
8. Delocalized chemical bonding.
9. Asymmetric synthesis of chiral drugs.
10. Phase transfer catalysis in reduction reaction.

[LG 344]

APRIL 2015

Sub. Code: 2905

M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY

Q.P. Code : 262905

Time: Three Hours

Maximum: 100 marks

Answer ALL questions

I. Elaborate on :

(2 x 20 = 40)

1. What do you understand by the term aliphatic nucleophilic substitution reactions?
Explain the reaction, kinetics, mechanism, stereochemistry and factor affect of SN1 reactions.
2. Discuss the reaction, mechanism and synthetic importance of
 - a) Grignard reaction
 - b) Hoffman reactions
 - c) Oppenauer oxidation.

II. Write notes on :

(10 x 6 = 60)

1. Discuss the effect of structure on reactivity with suitable examples.
2. Write note on asymmetric synthesis.
3. Write note on E2 elimination reactions.
4. Write note on electro cyclic reactions.
5. Discuss the synthetic approach and medical use of any one five member heterocyclic ring system.
6. Discuss the various types of mechanism with suitable examples.
7. Discuss the chirality and importance of chiral drugs.
8. Discuss the formation and stability free radicals.
9. Discuss the orientation and reactivity of monosubstituted benzene.
10. Write note on selective functional group inter-conversions.

[LH 344]

OCTOBER 2015

Sub. Code: 2905

**M.PHARM. DEGREE EXAMINATION
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Q.P. Code: 262905

Time: Three hours

Maximum: 100 marks

I. Elaborate on:

(2 x 20 = 40)

1. Explain the mechanism of Nucleophilic aromatic substitution reactions, orientation and reactivity of benzene.
2. a) Discuss free radical reactions and mechanism with suitable examples.
b) Discuss the formation, stability and reactivity of carbocation and carbanion.

II. Write notes on:

(10 x 6 = 60)

1. Discuss importance of di-functional compounds in synthetic chemistry.
2. Write note on sigma tropic rearrangement.
3. Write note on combinatorial chemistry.
4. Discuss reaction and synthetic importance of Beckmann rearrangement.
5. Write note on importance in chirality.
6. Discuss orbital symmetry rules and their importance.
7. Discuss acid and base theory and its limitations.
8. Write note on chemistry aspect of Phenothiazine.
9. Discuss elimination reactions vs. substitution reactions.
10. Discuss the role of phase transfer catalysts in reduction reactions.

[LI 344]

APRIL 2016

Sub. Code: 2905

**M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY**

Q.P. Code: 262905

Time: Three hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Describe the stability and structure of Free Radicals.
b) Discuss about the mechanism of Free Radical addition and substitution reactions with examples.
2. a) Explain the techniques used for preparing Chiral drugs and give it's importance.
b) Write a note on Retro synthetic analysis.

II. Write notes on:

(10 x 6 = 60)

1. Catalysts used in reduction reaction.
2. Write a note on Pericyclic reactions.
3. Describe the mechanism of Beckmann rearrangement.
4. Discuss about the basic concepts of Nanochemistry.
5. Give the applications of photochemical reactions.
6. Discuss about protection and deprotection of various groups.
7. Write a note about combinatorial chemistry.
8. Describe in detail the basicity of pyridine.
9. Explain the theory of acids and bases.
10. Give the mechanism and synthetic applications of Meerwin – pondroff's reduction.

[LJ 344]

OCTOBER 2016

Sub. Code: 2905

**M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY**

Q.P. Code: 262905

Time: Three hours

Maximum: 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Classify Heterocyclic compounds with examples. Write the preparation and properties of a fused ring structure containing hetero atom.
b) Write in brief about Carbenes.
2. a) What is Aromatic Electrophilic substitution reaction? Explain the mechanism with suitable examples.
b) Discuss the methods of deprotection of Carboxyl groups.

II. Write notes on:

(10 x 6 = 60)

1. Hoffman rearrangement reaction.
2. Selective functional group interconversions.
3. Types of cyclo addition reactions with examples.
4. Di-functional compounds.
5. Write a short note about Ozonolysis.
6. Mannich reaction.
7. Applications of photochemical reaction.
8. Phase transfer catalysis in ester and epoxide formation.
9. Effect of structure on reactivity.
10. Inductive and electromeric effect.

[LK 344]

MAY 2017

Sub. Code: 2905

**M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY**

Q.P. Code: 262905

Time : Three hours

Maximum : 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) What is Elimination reaction? Explain the mechanism of E1 reaction.
b) Explain about the stereo chemical aspects of S_N1 and S_N2 reaction.
2. Discuss the reaction mechanism involved in Reformatsky reaction, Oppeneauer oxidation, Meerwin-Pondroff's reduction and Grignard reaction.

II. Write notes on:

(10 x 6 = 60)

1. Discuss the free radical mechanism for chlorination of methane.
2. Write about localized and delocalized chemical bond.
3. Give any three reactions of Furan and Phenothiazine.
4. Describe about the catalyst involved in hydrolysis.
5. Write a note on orbital symmetry rule and applications.
6. Define Chirality and give the importance of chiral drugs.
7. Explain in detail about retro synthetic analysis.
8. What is mesomeric effect? Explain its importance in organic reactions.
9. Explain the mechanism and characteristics of sigmatropic rearrangement reaction.
10. Explain about the role of combinatorial chemistry in drug discovery.

[LL 344]

OCTOBER 2017

Sub. Code: 2905

**M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY**

Q.P. Code: 262905

Time : Three hours

Maximum : 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Distinguish the features of E1 and E2 elimination reactions.
b) Explain the techniques for the preparation of chiral drugs.
2. Discuss in detail about the following synthetic methodologies for obtaining drugs
 - a) Selective functional group Inter-conversions.
 - b) Disconnection approach.
 - c) Retro-synthetic analysis.

II. Write notes on:

(10 x 6 = 60)

1. Importance of Michael reaction.
2. Different types of peri-cyclic reactions with examples.
3. Hoffman rearrangement.
4. Importance of stereo selective synthesis.
5. Nucleophilic substitution reactions of pyridine.
6. Phase transfer catalysis in reduction reaction.
7. Neighboring group effect with suitable examples.
8. Delocalized chemical bonding.
9. Ozonolysis and its synthetic importance.
10. Basic theory of photo chemical reactions with its application.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LM 344]

MAY 2018

Sub. Code: 2905

**M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY**

Q.P. Code: 262905

Time : Three hours

Maximum : 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. a) Explain in detail about the formation, structure, stability and reactions involving Carbenes.
b) Outline each two synthetic methods for obtaining drug molecules having five membered and six membered heterocyclic ring system.
2. a) Discuss on Nanochemistry with special reference to its application in drug discovery.
b) Write a detailed note on aliphatic nucleophilic substitution.

II. Write notes on:

(10 x 6 = 60)

1. Chemical bonding.
2. Mechanism and applications of Oppenauer oxidation.
3. Mechanism of Walden inversion.
4. Orbital symmetry rules and its applications.
5. Techniques for preparing chiral drugs.
6. Theory of photochemical reactions.
7. Mechanism and applications of Ozonolysis.
8. Elimination reactions.
9. Synthesis of Phenothiazines and Purines.
10. Neighbouring group assistance in Free radical reactions.

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[LN 344]

OCTOBER 2018

Sub. Code: 2905

**M.PHARM. DEGREE EXAMINATION
FIRST YEAR
BRANCH II – PHARMACEUTICAL CHEMISTRY
PAPER II – ADVANCED ORGANIC CHEMISTRY**

Q.P. Code: 262905

Time : Three hours

Maximum : 100 Marks

I. Elaborate on:

(2 x 20 = 40)

1. Outline the detailed mechanism and discuss the synthetic importance of the following:
 - a) Beckmann rearrangement
 - b) Meerwin – Ponderoff's reduction.
2. Illustrate the mechanism involved in the pericyclic reactions with its applications. Discuss the various types of such reactions.

II. Write notes on:

(10 x 6 = 60)

1. Discuss on various Oxidising and Reducing agents used in respective reactions.
2. Discuss on Acids and Bases.
3. Discuss the stability of Carbocations.
4. Mechanism and applications of Michael reaction.
5. Effect of the solvents on mechanism of nucleophilic substitution reaction.
6. Basic theory of photochemical reactions.
7. Iodine is used as a Catalyst for aromatic bromination.
8. Importance of Chiral drugs in Pharmaceutical Chemistry.
9. Outline the synthesis of Indole.
10. Mechanism and synthetic importances of Reformatsky reaction
